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The Genus *Asimina*.*

ASA GRAY.

One object of this communication is to ask for fruits of the southern shrubby species, which seem to have been rarely collected. I possess ripe fruit of only one of these, namely, *A. parviflora*. Another object is to set right the generic character, in particular that of the æstivation of the corolla.

Formerly one of the diagnostic characters of the order Anonaceæ was the valvate æstivation of the petals. Their evident overlapping in the flowers of our so-called Papaw was one reason for dissenting from the conclusion of the old Flora of North America, where *Asimina* was reduced to a section of *Uvaria*, and restoring the genus in the Genera Illustrated. Since then it has been ascertained that all the genuine species of *Uvaria* have their petals imbricated in the bud, as I had suspected of some of them, and that in this they accord with several other genera; so that, indeed, Mr. Bentham, in the Genera Plantarum, brought them together to form his tribe *Uvarieæ*. It was purely my fault, as is recorded on p. 68 of the fifth volume of the Journal of the Linnean Society, that he did not include in it the genus *Asimina*. Misled by an imperfect observation, making sections of the lower part only of some flower-buds, I informed him that I had "ascertained that they were truly valvate." The fact is that, in this, as in many other genera of the order, the petals are of comparatively late growth; in the young bud they are distant, later their lower portion may come merely into contact and so give the idea of valvular æstivation of each series; but when they grow up and over the globular mass of the genitalia, their summits overlap somewhat largely in the imbricative manner. At least this is the case in *A. triloba*, and I find it essentially the same in the long- and narrow-leaved species which I name *A. angustifolia*. The following notes which I made upon living plants of *A. grandiflora*, in Florida, in the spring of the year 1875, show the same thing, with some difference. "Outer petals with their tops well overlapping in the early state of the bud, one external, one intermediate, one interior, and remaining so as they enlarge; down their sides only contiguous, their bases distant; in anthesis enlarging greatly. Petals of the inner series remote in the bud, enlarging only moderately, remaining erect, never coming into contact, their margins above the middle becoming revolute as they grow, and thus not actually overlapping.

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Their base becomes more and more deeply concave within, where it develops protuberant longitudinal and roughened ridges. The flowers as they open are much frequented by thrips or other small vermin, which are attracted to this secretive surface. The anthesis is strongly protogynous. The stigmas are effete much before any pollen is shed, which, indeed, takes place only when the anthers loosen and separate as they begin to decay and fall." I did not notice that the blossoms were "sweet-scented," though Bartram so describes them. The scent of the flowers in the genus is generally unpleasant.

Notwithstanding Baillon's view, it seems evident that our plants are not congeneric with the Old World *Uvariæ*. *Asimina* seems to be well characterized by the dissimilar petals of the two series; the outer always larger, much accrescent, thin and veiny, and spreading, while the inner are concave and erect, mostly of thicker texture, at least at the concave or almost saccate base, and quite different in shape, although the difference is least in *A. triloba* and *A. parviflora*.

I have not seen the Australian *Fitzalanina* of Mueller, which is said to have small inner petals, and their texture is not described. I have not sufficient materials for a proper investigation of the Cuban species, which Grisebach referred to *Asimina*. Their coriaceous and nearly homogeneous petals forbid their union with our genus, but they may belong to the still obscure genus *Porcelia*. Nothing can be determined respecting the place of Baillon's *Uvaria Hahniana*, of Mexico, until its flowers are known. As to Seemann's *Sapranthus* of Nicaragua, of which we have flowers collected by the late Charles Wright, by no means as large as those figured by Seemann, the homogeneous petals, all six alike, plane, thin, veiny, and equally accrescent, would seem to indicate a genus as distinct from *Porcelia* as from *Asimina*. I will conclude these remarks with a synopsis of the species of *Asimina*, as they now appear to stand. But further observations are needed on some of them.

ASIMINA, ADANS.*

* Flowers from the axils of the deciduous leaves of the preceding year; these ample, acute or acuminate at both ends, thin, the reticulation of veinlets inconspicuous: petals moderately accrescent, from green becoming brown-purple, ovate or roundish; the inner moderately concave and nearly even within, not very much smaller: the first a tree or shrub; the second a low shrub.

A. triloba DUNAL. Pedicels about the length of the middle-

*As to the French-colonial name, *Assimintier*, Mr. Gerard of New York informs me that it was adopted from the Ojibway Indian name of the fruit of *A. triloba*.

sized flowers: styles distinct, introrsely stigmatic at and below the tip: ovules numerous in two rows: seeds flat.

A. parviflora DUNAL. Pedicels very short and flowers much smaller: petals less accrescent: stigma sessile on the ovary: ovules about 10, nearly in a single series: seeds few, turgid.

*** Flowers from the axils of less deciduous leaves (commonly in pairs or accompanied by a leafy shoot from the same axil); these furfuraceous-tomentulose when young, retuse or obtuse, becoming subcoriaceous in age, then with conspicuous reticulation of veinlets: petals white, very unlike in size and shape; the outer much accrescent and membranaceous, roundish and at length obovate; inner thicker, saccate-concave at base, the concavity purple or pink and conspicuously rimose-corrugate longitudinally; stigma sessile and depressed: low shrubs.

A. grandiflora DUNAL. Leaves when young with both sides (as well as the shoots) tomentulose: leaves spatulate-oblong to obovate or oval: outer petals 2 inches or more long when full-grown, 3 or 4 times the length of the revolute-margined inner ones.

A. cuneata SHUTTLEWORTH in distrib. coll. Rugel. Less pubescent: leaves smaller (an inch or two long) and mostly narrower, glabrate, even the nascent ones glabrous or nearly so above: pedicels solitary: outer petals only an inch long, about twice the length of the inner.—Pine barrens of S. Florida; first coll. near Lake Monroe, in young fruit only, by *Rugel*, no. 8. Several years later in flower, by *Palmer*, *Havard*, and apparently by *Feay*, if it is *A. reticulata* Chapm., Fl. Ed. 2, 603, as I suppose from the description.

*** Flowers in the axils of extant subcoriaceous and subsessile reticulate-venulose leaves: outer and inner petals very unlike; those of inner series rimose-corrugate in the concavity, as in the preceding section: ovaries distinctly styliferous and 8 to 10-ovuled: fruit not seen: glabrous under-shrubs (rarely some minute pubescence); the flowering stems mostly simple and hardly woody, but springing from a woody base or stock.

A. angustifolia. Stems 2 or 3 feet high, erect: leaves elongated, from narrowly linear (and 5 or 6 inches long by 2 to 4 lines wide) to narrowly spatulate: flower white, large, commonly erect: outer petals much accrescent, $1\frac{1}{2}$ to 2 inches long, oblong; inner much narrower and smaller, lanceolate above the saccate-concave internally purple-spotted base: ovaries almost glabrous.—This is the *Orchidocarpum pygmæum* of Michaux, in part, perhaps mainly, and the *Asimina pygmæa* figured by Dunal in his monograph, also in part the *Uvaria pygmæa* of Torrey & Gray's Flora. Good specimens of it were distributed in Curtiss's col-

lection as *A. pygmæa*, var., no. 87*. But it is not the original *Annona pygmæa* of Bartram, as his description and good figure show. Shuttleworth and his collector Rugel discriminated the species, but, following Dunal, took it for *A. pygmæa*, and so gave new names to the old species of Bartram. It is not rare in the sandy pine woods of Florida. In setting the species right I am obliged to give it a new name.

A. pygmæa DUNAL, Monogr. 84, as to syn., etc. Stems a foot or two high, commonly declined or arcuate: leaves from cuneate-linear to oblong, 1 to 4 inches long, half inch to full inch wide, reticulated: flower greenish turning purple, strongly nodding: outer petals moderately accrescent, at most half inch long, ovate and becoming ovate-lanceolate, not broader nor more than half longer than the ovate inner ones.—*A. pygmæa* largely of authors, and of Curtiss distrib. no. 87. *Annona pygmæa* Bartram, Trav. ed. Amer. 18, t. 1, the figure and description both unequivocal. Bartram says that "the flowers both in size and colour resemble those of the Antrilobe." *Antrilobe* is a puzzle, but I guess it to be a printer's mistake of *An. triloba*. The foliage varies greatly. The commoner narrow-leaved form figured by Bartram was named by Shuttleworth *A. secundiflora*. A form with small and comparatively broad leaves is his *A. reticulata*.

Revision of the North American species of Nuphar.

THOMAS MORONG.

(WITH PLATE VI.)

Along the shores of Lake Champlain there grows a species of Nuphar, which has long been a puzzle to botanists. It has been variously regarded as *N. luteum* Sm., *N. luteum*, var., *N. Kalmianum* Pursh, and *N. intermedium* Ledeb. Some have pronounced it a hybrid. This Nuphar first attracted my attention two years ago in the Adirondack regions of New York, where it was very abundant in Little Tupper lake and the adjoining waters, Rock Pond and Charley Pond. Since then botanical friends have sent it to me from Ottawa, Canada, from Lake Memphremagog and other places in the Northern States.

Last summer I spent a portion of my vacation in collecting and studying this plant at Ferrisburgh, Vt. It occurs plentifully at that point in the mouths of Lewis and Little Otter creeks, and thence along the Vermont shore to Missisquoi Bay. There